

REMARKS/ARGUMENTS

Reconsideration and allowance in view of the foregoing amendment and the following remarks are respectfully requested.

Claims 1-15 and 23 remain withdrawn from consideration. Once this application is otherwise in condition for allowance, authorization is hereby given for the Examiner to cancel non-elected and currently withdrawn claims 1-15 and 23, provided no generic claim is present.

The specification was objected to as allegedly failing to provide proper antecedent basis for the claimed subject matter. The specification has been amended above to parenthetically reference the terminology utilized in the claims and to provide clear antecedent basis for the claimed subject matter. No new matter has been added. Reconsideration and withdrawal of the objection are solicited.

Claims 16, 17 and 24-26 were rejected under 35 USC 103(a) as being unpatentable over Heinbeck in view of Tani. Applicant respectfully traverses this rejection.

Independent claim 26 has been canceled above to advance prosecution. Furthermore, claim 16 has been amended to incorporate the limitations of previously dependent claim 17 and for clarity.

An object of the present invention is to provide a fuel injection device that can improve atomization of fuel injected into respective cylinders of an engine. Claim 16 has been amended above so that it more specifically defines two characterizing features of the invention. First, each of the outer openings is symmetrical with respect to a line extending in a lateral direction. (Please see attached annotated copy of Figure 19 in which this line is indicated.). Secondly, the center opening (more specifically, the enlarging area portions thereof) are symmetrical with the said line extending in the lateral direction. With the structure defined in amended claim 16, a center line of the

outer opening crosses a center of the center opening. Accordingly, fuel supplied to the outer openings flows into the center opening in such a manner that each of the two fuel flows impinge against the other fuel flow in the center opening, as indicated by handwritten arrows in the attached annotated copy of Figure 19.

Referring to Figure 7 of Heinbeck, the swirl channels 66 arguably constitute outer openings whereas the swirl chamber 68 arguably constitutes a center opening. However, as understood from Figure 7, the swirl channels 66 are symmetrically formed with respect to the center of the swirl chamber, that is, symmetric with respect to the center point but not symmetrical with respect to a line extending in a lateral direction. As a consequence, with the structure of Heinbeck, the fuel from each swirl channel 66 does not impinge against the other fuel flow(s) but, rather, the fuel from each swirl channel 66 flows tangentially along an inside surface of swirl chamber 68 to form a swirl as is Heinbeck's object.

As will be understood from the foregoing, the structure and function of the present invention is completely different, particularly in the resultant fuel flow, from Heinbeck. Therefore, even if multiple outlet openings 69 could be provided in the structure of Heinbeck, the modified Heinbeck structure would still be different from that of the present invention in respect to the configuration and disposition of the outer chambers and the resultant fuel flow and atomization. Indeed, the modified Heinbeck structure would still provide for swirl flow rather than impingement from diametrically opposite sides of the center opening.

For all reasons advanced above, reconsideration and withdrawal of the Examiner's rejection of claims 16 and the claims that depend from it over Heinbeck and Tani is solicited.

Claims 16, 17 and 24-26 were also rejected under 35 USC 103(a) as being unpatentable over Heinbeck in view of Fuchs. Applicant respectfully traverses this rejection.

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These claims are submitted to be distinct from Heinbeck for the reasons advanced above. The Examiner's reliance on Fuchs does not overcome the deficiencies of Heinbeck with respect to the basic structure of the center and outer chambers so that even if these prior art references could be combined, the invention claimed would still not be anticipated nor obvious.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

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